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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Gin Liu

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PATENT ADMINISTRATOR

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EXAMINER

GHULAMALI, QUTBUDDIN

ART UNIT

PAPER NUMBER

2611

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

03/28/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

2/

Office Action Summary	Application No.	Applicant(s)	
	10/024,020	LIU ET AL.	
	Examiner	Art Unit	
	Qutub Ghulamali	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 10-16, 31-50 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 10-16, 31-50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is responsive to the Amendment/Remarks filed by the applicant on 01/03/2007.
2. The office acknowledges applicant's amendment to the specification.

Response to Amendment/Remarks

Applicant's amendments/remarks, filed 01/03/2007, with reference to rejection of claims 1-7, 10-16 and 31-37, and newly recited claims 38-50, have been fully considered but are moot in view of the new ground(s) of rejection. The rejection based on the new art to Murphy follow.

Claim Objections

3. Claims 3 and 47 are objected to because of the following informalities: Claims 3 and 47 are duplicate claims (MPEP 706.03(k)). Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application

by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 1-7, 10-16, 31-43, 47-50, are rejected under 35 U.S.C. 102(e) as being anticipated by Murphy et al (USP 6,628,754).

Regarding claim 1, Murphy discloses a method and an apparatus of retrieving channel characteristics for a discrete multi-tone communication channel having a plurality of bins comprising:

determining and storing on a per bin basis channel frequency response and noise measurements at a first end (Central Office (CO)) of the channel at initialization (the modem 26 and ATU 18 exchange expected transmitter settings during initialization sequence procedure in order to determine what transmission attributes and characteristics (frequency response and noise) of the upstream - from CPE to CO, and downstream - from CO to CPE, are necessary to reach Showtime, as is well known in the ADSL art once the ATU 18 and the modem 26 achieve Showtime, the modem stores the settings of its upstream transmitter as a profile in the modem's 26 memory, similarly the ATU 18 stores the settings of its downstream transmitter as a profile in the

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ATU's 18 memory) (abstract; col. 2, lines 31-43; col. 6, lines 17-30; col. 7, lines 35-49; col. 13, lines 38-60);

determining and storing a signal-to-noise measurement on a per bin basis at the first end (Central Office (CO)) at show time (the characteristics such as frequency response and signal to noise ratio are stored on a per bin basis) (abstract; col. 5, lines 64-67; col. 6, lines 1-15, 25-33; col. 13, lines); and

retrieving the stored (transmission attributes such as frequency response and noise measurements (col. 6, lines 25-33)) channel frequency response, noise and signal-to-noise measurements at a second end of the channel (CPE) (a fast retrain procedure retrieves attributes at initialization at Showtime) (col. 6, lines 6-16, 17-33; col. 13, lines 42-60; col. 14, lines 15-20, 37-55).

Regarding claims 2, 11, 32 Murphy discloses first end comprises a central office (CO) end, and the second end comprises a customer premise equipment (CPE) end (fig. 1; col. 3, lines 50-60).

As per claims 3, 6, 12, 15, 33 and 36, Murphy discloses the channel is asymmetrical as is inherently implied with the use of ADSL utilizing DMT modulation (col. 3, lines 15-40).

As per claims 4, 13, 34 these claims are analyzed in a similar fashion as claims 2, 11 and 32 as Murphy discloses transmitter to receiver and receiver to transmitter functions in a transceiver embodiment (col. 6, lines 6-16).

Regarding claims 5, 14 and 35, Murphy discloses the channel is non-overlapping (DMT is non-overlapping is inherently implied) (see col. 5, lines 20-33).

As per claims 7, 16, 37 the claims are design related and the xDSL technology can be adapted to a very high bit-rate DSL channel disclosed in Murphy (col. 3, lines 40-54).

As per claim 10, the steps claimed as circuit (apparatus) is nothing more than restating the function of the specific components of the apparatus as claimed and therefore, it would have been obvious, to a person of skill in the art at the time of the invention, to utilize steps in forming circuit components so as to achieve the desired results of Murphy, considering the aforementioned rejection for the method claim 1 above.

Regarding claim 31, Murphy discloses all limitations of the claim. Murphy further discloses a computer or other computing device encoding a computer program means for execution by computer (see appendix A) (col. 5, lines 5-15).

As per claims 38 and 41, the channel response at initialization is a program function which can be programmed to represent a normalized complex number (col. 8, lines 44-67).

As to claims 39 and 42, the channel frequency response at initialization is traditionally communicated via the tip and ring of a copper loop in any given telephone circuit configured to transmit specified information over the twisted pair and is inherently implied with the use of telephone circuits.

Regarding claims 40 and 43, Murphy discloses noise measurements at initialization is communicated via the twisted copper pair, the ends of which are

traditionally referred to as tip and ring to provide connection to customer line or equipment (see col. 4, lines 30-34; col. 7, lines 45-67).

Regarding claims 47 and 49, the channel can be symmetrical is well known in the art disclosed as prior art of the instant application (see page 2, lines 5-14).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 48 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy et al (USP 6,628,754) in view of McFarland et al (USP 6,628,673).

Regarding claims 48 and 50, Murphy discloses all limitations of the claim except does not explicitly disclose channel is overlapping. However, McFarland in a similar field of endeavor discloses channel can overlap (col. 1, lines 44-57; col. 8, lines 23-33). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have channel overlap as disclosed by McFarland in the system on Murphy because due to characteristics of the inverse Fourier Transform the channel appear to overlap even though subcarrier orthogonality is implied.

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8. Claims 44, 45 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy et al (USP 6,628,754) in view of Zuranski et al (USP 6,263,077).

Regarding claim 44, 45, 46, Murphy discloses all limitations of the claim. Murphy though shows the advantage of data allocation so that the throughput of each sub-channel is maximized by limiting thermal noise and cross talk, except does not explicitly disclose analyzing time dependent changes (noise) in cross talk levels and line attenuation (fading) at the second end of the channel. Zuranski in a similar field of endeavor discloses analyzer (130) analyze time dependent changes (performs spectral analysis, the analyzer performs FFT and can also perform inverse Fourier transformation, in a first frequency range through an equalizer reducing or attenuating cross talk) in cross talk levels and line attenuation (fading) at the second end of the channel (col. 4, lines 1-2, 30-35, 53-67; col. 5, lines 1-12, 30-40; col. 9, lines 25-30, 31-63; col. 13, lines 18-42). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to analyze time dependent changes (noise or cross talk signal to noise ratio) to maintain line attenuation as taught by Zuranski in the system of Murphy because it can reduce or mitigate the near and far end cross talk noise from data propagated in data rate upstream or downstream of communication signal.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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US Patents:

(US Pub. 2002/0131371) to Rudnick.

(USP 6,044,403) to Gerszberg et al.

(USP 6,373,860) to O'Toole et al.

(USP 6,192,109) to Amrany et al.

(USP 5,487,069) to O'Sullivan.

(USP 6,721,394) to Murphy et al.

(USP 6,724,849) to Long et al.

(US Pub. 2005/0041753) to Cunningham.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutub Ghulamali whose telephone number is (571) 272-3014. The examiner can normally be reached on Monday-Friday, 7:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

QG.

March 19, 2007.


MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER